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ABSTRACT

This investigation examined in two different samples, whether only children differ significantly from firstborn and later-born children in terms of their vocational personality type as described in Holland's RIASEC model, occupational interests, and work values. Literature on family configuration and vocational behavior is reviewed, and current theories relating career and family variables are discussed. Study 1 (medical students) examined the effects of birth order on vocational interest patterns and work values. ANOVA results indicated significant differences among three birth-order groups derived from a medical student sample in their vocational personality types, occupational interests, and work values. Support for birth-order differences in vocational type within a college student sample using ANOVA procedures failed to emerge in Study 2 (of college students), although some additional support was found for differences in occupational interests among the three birth-order groups. Findings from the two studies are related to each other and limitations are discussed. Research and counseling implications are addressed. (EMK)

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Birth-Order Effects on Holland Type, Occupational Interests, and Values

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Abstract

This research examined whether birth order accounts for significant variance in vocational personality type, occupational interests, and work values in two different samples. ANOVA results of Study 1 indicated significant differences among three birth-order groups derived from a medical student sample in their vocational personality types, occupational interests, and work values. Support for birth-order differences in vocational type within a college student sample using ANOVA procedures failed to emerge in Study 2, although some additional support was found for differences in occupational interests among the three birth-order groups. Research and counseling implications are addressed.

Birth-Order Effects on Holland Type, Occupational Interests, and Values

Adlerian vocational theory postulates that family variables significantly influence career development and vocational behavior (Watkins, 1984). Family constellation and, more specifically, birth order within the family of origin represent key family variables. Watkins theorized that birth order, or psychological position in the family of origin, spawns particular "interactional-environmental" (p. 38) events. For example, parents may demand and expect different things of children occupying different ordinal positions. Similarly, families may accord unique privileges and rights to children of designated birth orders. In theory, these interactional-environmental events differentially shape individual vocational outcomes such as work-role self-concept, work-role behaviors, and interpersonal work style. Individuals of different birth orders thus can in theory be expected to exhibit characteristic patterns of vocational behavior, interests, values and so on.

Research has supported Adlerian vocational theory by indicating that birth order and family configuration do indeed influence vocational choices and occupational interests (Amerikaner, Elliot, & Swank, 1988; Bryant, 1987; Claudy, 1984; Ernst & Angst, 1983). However, few studies include data on only children and use constructs from established career theories to investigate birth order effects on vocational behavior. The need to examine birth order effects on vocational variables gains significant support from research by Zajonc and Mullally (1997) who concluded that "[c]ontrary to the prevailing doubts in its explanatory value, birth order is being rapidly reinstated as a salient factor in psychology" (p. 698). The present investigation therefore examined in two separate studies whether only children differ significantly from firstborn and later-born children in terms of their (a) vocational

personality types as described in Holland's (1985) RIASEC model, (b) occupational interests, and (c) work values.

Family Configuration and Vocational Behavior

Research has examined the effects of family configuration on occupational choices. One review of this research concluded that only children tend to hold more prestigious jobs and have better educated spouses (Veenhoven & Verkuyten, 1989). Although several studies in this review found only children obtaining higher levels of education than non-onlies, another study (Groat, Wicks, & Neal, 1984) found no significant differences in occupational prestige or family income for only children. An earlier review noted the overrepresentation of firstborn children attending universities, but concluded that firstborns are no more likely than lastborns to attend college (Gandy, 1974).

Claudy (1984) reviewed Project TALENT, a 1960 interview of high school students followed up either 11 or 14 years later. The original data included a survey of occupational interests grouped into 17 broad occupational areas. Six of these areas (public service, social service, art, business management, sales, and farming) yielded no differences between only and non-only children. Four areas did show significant differences. Only children preferred biological science, medicine, and music, whereas non-onlies favored mechanical/technical and skilled trades. Although not statistically significant, other differences showed a definite trend: "Only children have greater interest in physical science, biological science, music, computation, and literary areas, while nononly children have greater interest in sports, hunting/fishing, office work, mechanical/technical, skilled trades and labor" (Claudy, 1984, p. 225).

The stereotype of only children having higher IQ's has generally not

received great empirical support. However, Claudy's (1984) review found that only children show much more interest in white-collar, scientific, and intellectual occupations. Claudy theorized that the greater amounts of parental attention single children typically receive may account for this finding. Alternatively, because these children may perform at higher intellectual levels they may be able to choose more intellectual occupations over manual labor.

Blau and Duncan (1967) conducted one of the most complete studies on occupational status using a sample of over 20,000 men. They found that youngest sons held the highest status jobs, followed by oldest sons, and then others. Although a discernable pattern emerged from their findings, the lack of statistically significant differences led the investigators to conclude that birth order has a negligible influence on occupational status.

There seems to be a pattern relative to the occupations with an overrepresentation of firstborns. Studies indicate high concentrations of firstborn children among scientists and mathematicians (Visher, 1947, 1948; Roe 1953; Helson & Crutchfield, 1970), research personnel (West, 1960), lawyers (Very & Zannini, 1969; Very & Prull, 1970; Very, Goldblatt, & Monacelli, 1973), male medical students (Cobb & French, 1966), and female teachers (Sutton-Smith, Roberts, & Rosenberg, 1964). Firstborn women seem to be overrepresented within academic positions (Monson & Gorman, 1976).

Early studies of birth order and vocational behavior tended to examine the distribution of different sibship patterns for individuals within particular occupations (Helson, & Crutchfield, 1970; Very & Prull, 1970; Very & Zannini, 1969). A review of the birth-order and vocational behavior literature (Watkins & Savickas, 1990), for example, indicated that higher than expected numbers of firstborns become physicians, attorneys, members of

Congress, teachers, and nurses. Many of the studies Watkins and Savickas reviewed examined the relationship between birth order and occupational choice by attempting to determine whether particular occupations contain disproportionate numbers of individuals of particular ordinal positions (e.g., higher than expected numbers of firstborn physicians). The birth order and vocational literature clearly lack studies that examine if and how ordinal position relates to variables such as vocational interests, work values, and vocational personality type. Studies in this vein are needed because such variables, and vocational interests in particular, do not always translate automatically and directly into occupational choices.

Career Theory and Family Dynamics

Most career theories recognize family dynamics and family-of-origin experiences as important variables affecting career development and vocational behavior (Herr & Lear, 1984). Notably, life-span, life-space theory (Super, 1957; 1990; Super, Savickas, & Super, 1996) suggests that family variables such as attitudes, values, and interpersonal relations influence individuals' career choices and adjustment. Similarly, the theory of vocational personalities and work environments (Holland, 1985; Spokane, 1996) posits that vocational personalities begin forming in childhood as a function of family dynamics, with preferences for specific activities leading to vocational interest development. From age one to age eight children move toward groups of preferred activities, interests, competencies, and values that promote distinct skill development and form the bases of their developing vocational personalities. Holland contends that an individual's unique heredity and life experiences play key roles in furthering that individual's evolving vocational type.

Adler's earlier ideas about the role of birth order in personality

development approximate what Holland later observed about the role of parent-child interaction in vocational personality development: "[C]hildren create their own environment to a limited degree by their demands upon parents and by the manner in which parents react to and are influenced by children" (Holland, 1985, p. 16). Thus, Holland's general view in many ways parallels what Adler specified about particular ordinal positions such as the following:

> The firstborn child is generally given a good deal of attention and spoiling. Too often it is quite suddenly and sharply that he [sic] finds himself ousted from his position. Another child is born and he is no longer unique. Now he must share the attention of his mother and father with a rival (Ansbacher & Ansbacher, 1956, p. 377).

Despite the apparent parallels between Adlerian theory and the career theories of Super and Holland, no studies directly connect these approaches. The present research therefore attempted to empirically link Adler's birth order concept with Holland's observations about personality type development within the family system and Super's emphasis on work values. To do this, we conducted two studies to examine whether significant differences in vocational personality type (described in Holland's RIASEC model), occupational interests, and work values exist among only children, firstborns, and later-born children. Although prior research indicates that birth order and family configuration do influence vocational choices, few studies include data on only children. The present investigation therefore examines the effects of being an only, firstborn, or later-born child on selected vocational behavioral variables across two different samples.

Study 1

Purpose

Previous research has tended to examine the influence of birth order on

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choices of specific occupations (e.g., medicine and law) rather than on choices across the occupational spectrum. Moreover, most earlier studies primarily investigated the influence of birth order on actual occupational choice (e.g., studying whether firstborns appear overrepresented among a group of lawyers). In contrast, Study 1 examined the effects of birth order on vocational interest patterns and work values. The importance of this distinction, and the significance of the present study, rests on the premise that vocational interests and occupational choices do not show a perfect relationship. For a variety of reasons, including social stereotyping and discrimination, many individuals may not enter occupations of greatest interest to them. It thus seems important to examine the influence of birth order separately on both occupational choices and vocational interest patterns. Also, using constructs from P x E fit (Holland's) and developmental (Super's) career theories permits studying birth order influences on vocational behavior within established theoretical frameworks. We hypothesized that only children would differ significantly from firstborn and later-born children in their vocational personality (i.e., Holland) types, occupational interests, and work values.

Method

Participants

Participants consisted of second-year medical students completing a career specialty choice workshop. Of the 161 total workshop participants, 159 students (99 females and 60 males) produced useable data. These students ranged in age from 21 to 40 years (M = 25.6 years, SD = 3.2). Participants identified themselves as only children (3%), firstborn children (37%), and later-born children (60%) on the demographic questionnaire provided. European Americans constituted the preponderance of the sample (89%) with fewer Asian

Americans (5%), African Americans (3%), and others (3%).

Measures

Strong-Campbell Interest Inventory. Vocational personality type and occupational interests were operationally defined and indexed using the General Occupational Themes (GOT) and Basic Interest Scales (BIS) of the Strong-Campbell Interest Inventory (SCII; Campbell & Hansen, 1981). The GOT categorize individuals according to Holland's (1985) RIASEC model: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. The BIS, also grouped by Holland type, yield scores in 23 specific occupational interest areas (e.g., Science, Military Activities, and Medical Service). Respondents complete the SCII by indicating their liking, indifference, or disliking for 325 occupations and activities. Median GOT and BIS test-retest reliabilities range from .81 to .91 (Borgen, 1988). The manual provides extensive evidence for the validity of the SCII.

Values Scale. The 106-item Values Scale (VS; Super & Nevill, 1985) operationalized and measured work values. Each VS item begins with the stem "it is now or will in the future be important to me to..." followed by a statement. The VS assesses 21 intrinsic and extrinsic values such as Ability Utilization (e.g., "use all my skills and knowledge") and Economic Security (e.g., "be where employment is regular and secure"). Five items comprise each scale with one final item used in cross-national research. Level of importance of each value is assessed on a Likert-type scale ranging from 1 ("Of little or no importance") to 4 ("Very important"). Scale scores range from 5 to 20 with higher scores indicating more importance placed on the corresponding value. Manual or computer scoring yields a profile sheet for ipsative interpretation. The scoring service provides local percentile norms for 100 or more cases. Internal consistency estimates and test-retest

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reliability coefficients for all but three VS scales exceed .70 for high school, college, and adult samples (Super, Osborne, Walsh, Brown, & Niles, 1992). Counselors should use caution when interpreting Ability Utilization, Lifestyle, and Personal Development scores because these have reliabilities lower than .70 (Super et al., 1992). A literature review on the VS provides extensive evidence for its reliability and validity (Niles & Goodnough, 1996).

Procedure

Participants completed both measures and a brief demographic questionnaire in large classroom settings. Before completing the instruments, participants learned the nature of the study and that their participation was voluntary and confidential. Opportunities were provided for participants to ask questions and they were offered the chance to receive their assessment results at a career workshop conducted later in the academic term.

Data Analysis

Scale means and standard deviations were computed for each measure. Using responses to the demographic questionnaire item that asked participants to indicate their birth orders, three participant groups were derived. These groups included only children, firstborn children, and laterborn children (i.e., those individuals indicating other birth orders such as secondborn, middle, and youngest children). Analysis of variance (ANOVA) procedures were used to test for statistically significant differences in mean GOT, BIS, and VS scores among these three birth-order groups.

Results

Table 1 presents the means, standard deviations, and ANOVA results of the scores for the six Holland types and 23 occupational interests assessed by the SCII. Statistically significant differences at the .05 level among the three birth-order groups surfaced on three of the six GOT scales.

Specifically, laterborn children produced significantly higher mean scores on Realistic (M = 51.00, F[2, 156] = 2.09) and Artistic (M = 55.10, F[2,156] = 3.50) than did firstborn children on these two scales (M = 48.10 and M = 51.59, respectively). On the Investigative scale, only children scored higher (M = 58.00) than did firstborns (M = 51.83) or laterborns (M = 54.57) and these differences reached significance, F(2, 156) = 4.58.

In terms of the BIS four significant pair-wise differences emerged in scores among the three birth-order groups. Laterborn children scored higher on Music (M = 55.55, F[2, 156] = 2.74), Athletics (M = 53.75, F[2, 156] = 5.18), and Nature (M = 53.70, F[2, 156] = 2.31) than did firstborns on these three scales (M = 52.37, M = 51.46, and M = respectively). Laterborn children scored higher on the Agriculture BIS (M = 52.19) than did only children (M = 43.17) with this difference significant at F(2, 156) = 3.12. Laterborns also scored significantly higher on Athletics (M = 53.75) than did only children (M = 43.17), F(2, 156) = 5.18. These results support the GOT findings and reveal a pattern of laterborn children preferring musical, physical, and outdoor activities.

More pronounced birth-order differences emerged in terms of scores on the VS as seen in Table 2. Ten of the 21 VS subscales showed statistically significant pair-wise score differences. Only children scored higher than both of the other two birth-order groups on Aesthetics (M = 17.83, F = 5.39), Altruism (M = 19.67, F = 4.09), Creativity (M = 17.00, F = 2.90), Life Style (M = 17.83, F = 2.36), Personal Development (M = 19.00, F = 3.52), Working Conditions (M = 17.17, F = 3.67), Cultural Identity (M = 14.17, F = 2.65), and Economic Security (M = 17.83, F = 3.20). Only children scored higher on Ability Utilization (M = 19.50, F = 2.29) than did firstborns (M = 17.73) and onlies scored higher on Economic Rewards (M = 17.00, F = 3.89) than did

laterborns (M = 13.27).

Grouping the values from the VS into clusters as described in Nevill and Super (1986) permitted another way of analyzing these data. Table 3 shows the four VS clusters identified in a factor analysis reported by Nevill and Super. The first cluster, "Material," consists of Advancement, Economic Rewards, Economic Security, Prestige, and Life Style. The second cluster, "Activity and Risk," includes Physical Activity, Risk Taking, Authority, and Creativity. The third cluster, "Group Oriented," contains Aesthetics, Altruism, and Cultural Identity and refers more to cultural than to social values. The fourth cluster, "Inner Oriented," contains Ability Utilization, Achievement, Autonomy, Creativity, and Life Style. ANOVA results yielded significant differences among birth-order groups in their scores on three of the four value clusters. Only children scored higher than the other two groups on Material (M = 80.83, F = 3.28), Group Oriented (M = 51.67, F = 7.26), and Inner Oriented (M = 90.17, F = 4.21) values.

Study 2

Purpose

Given that previous studies have demonstrated that only children and firstborn children may be overrepresented among physicians, the use of a medical student sample in Study 1 may have generated some biased findings. Study 2 sought to assess the extent of this bias in the SCII data and to cross-validate the vocational personality type and occupational interest results of Study 1 in a more heterogeneous, non-professional school sample. To minimize measurement differences, the SCII was also used in Study 2.

Method

Participants

Participants included 119 undergraduate students (54 females, 66 males)

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majoring in a wide range of academic fields at a comprehensive university in the midwestern United States. These volunteer participants had an average age of 20.9 years, with a standard deviation of 2.41. Participants identified themselves as only children (3%), firstborn children (36%), and later-born children (61%).

Procedure

As part of a separate study examining the relationship between personality and vocational interest patterns, participants completed the SCII and a demographic questionnaire in standard classroom settings. Prior to completing the instruments, participants learned the nature and confidentiality of the study and what their voluntary participation would entail.

Data Analysis

Study 2 sought to determine if the birth-order groups identified in the sample differed significantly in their mean GOT and BIS scores. For consistency, we designated the same three birth-order groups as reported in Study 1. We calculated descriptive statistics for SCII scores and used ANOVA procedures to test for mean score differences among the three groups.

Results

Table 4 presents the descriptive statistics and ANOVA results for the SCII scores. Examining the table reveals that the three birth-order groups did not differ significantly in their mean GOT scores on the SCII. Birth order thus appears non-contributory to an understanding of any observed mean scale score differences in vocational personality type in this sample.

In terms of the mean BIS scores on the SCII, firstborn children scored significantly higher than both of the other groups on Agriculture (M = 53.07, $F[2, 116] = 3.26$) and Nature (M = 53.74, $F[2, 116] = 3.48$). Firstborns also

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scored higher on Athletics (M = 50.16) than did only children (M = 34.50), F[2, 116] = 6.98. Laterborn children scored higher on both Agriculture (M = 52.32, F[2, 116] = 3.26) and Nature (M = 53.50, F[2, 116] = 3.48) than did only children on these two scales (M = 41.00 and M = 40.25, respectively). Laterborns also scored higher on Athletics (M = 52.63) than did only children (M = 34.50), F(2, 116) = 6.98. On the Writing scale, only children scored higher (M = 61.50) compared to laterborn children (M = 48.17), F(2, 116) = 3.96.

General Discussion

We set out to examine whether three birth-order groups differ significantly on three variables. These variables included (a) personality type as defined in Holland's (1985) RIASEC model, (b) vocational interest patterns, and (c) work values. Examining differences on these variables would help to identify potential links between birth order as a psychological construct relative to family of origin dynamics and specific constructs derived from two preeminent career theories.

In terms of vocational personality type, three significant birth-order group differences emerged in GOT scores within the medical student sample. Compared to their firstborn counterparts, laterborn medical students scored significantly higher on the Realistic and Artistic occupational themes of the SCII. Only children medical students scored significantly higher on the Investigative theme than did either of the other two groups. These findings suggest that laterborn medical students possess vocational personalities tending toward either more physical, practical, and material or emotional, expressive, and sensitive personality traits. Firstborn children appear to possess fewer Realistic and Artistic traits as described by Holland (1985) than do laterborns. Also relative to firstborn children, only children

medical students exhibit personality styles tending toward more cognitive and analytical pursuits. Given that firstborn children often are described as characteristically similar to onlies, these data suggest that firstborns as a group possess a less Investigative style than do their only children counterparts. This finding contrasts with previous research which indicates higher concentrations of firstborns among scientists (Visher, 1947, 1948; Roe 1953; Helson & Crutchfield, 1970), researchers (West, 1960), medical students (Cobb & French, 1966) and physicians (Watkins & Savickas, 1990). Unlike with Study 1, results of Study 2 indicated no significant differences in mean GOT scores among a sample of undergraduate college students. Ordinal group membership did not account for significant amounts variance in vocational personality type.

Occupational interest patterns differed minimally across the three birth-order groups of medical students. Laterborns scored significantly higher than firstborns on the Music, Athletics, and Nature BIS of the SCII. They also scored significantly higher than onlies on the Agriculture and Athletics BIS. These results indicate that firstborn children possess less interest in physical or outdoor activities than do other birth order groups. This finding supports earlier research reviewed by Claudy (1984). Parents of only children may discourage pursuit of physical or outdoor activities because they view their one and only progeny as more precious and vital, fearing potential physical harm of that child. Consequently, parents of only children may encourage their children to develop more academically-oriented interests. Regardless of the mechanisms, only children may learn to channel their interests into more cognitive and less physical activities. Similar findings within the BIS data in the college student sample suggest that firstborns show greater interest in outdoor pursuits than do individuals of other birth-order

positions. They also show greater interest in athletic pursuits than do only children. Laterborn children appear more interested in agricultural, athletic, and nature-related occupations than do only children. The only children college students did evidence more interest in writing than did laterborns, lending support to the possibility that onlies prefer more cognitive or, perhaps, creative activities and endeavors.

Within the medical student sample, firstborn and laterborn children scored significantly lower than only children on eight of the 21 work values measured by the VS. These included Aesthetics, Altruism, Creativity, Life Style, Personal Development, Working Conditions, Cultural Identity, and Economic Security. Additionally, firstborns scored lower on Ability Utilization, and laterborns scored lower on Economic Rewards than did onlies. Firstborns and laterborns also scored lower than onlies on three of the four value clusters measured by the VS: Material, Group Oriented, and Inner Oriented. These findings reveal a pattern of only children generally ascribing greater importance to a variety of values across the spectrum measured by the VS than do firstborn or laterborn children. Perhaps socialization differences lead only children to emphasize, for example, personal development and self-actualizing over social relations in pursuing their career goals. The exception is only children's greater valuing of altruism. Perhaps they view altruism as one manifestation of a self-actualized person. Only children's greater concern with ability utilization, aesthetics, and working conditions seems consistent with their occupational interest patterns (i.e., greater interest in intellectual rather than physical or social pursuits).

The present data give further empirical evidence to support the contention within Adlerian vocational theory that individuals of different

birth orders develop different vocational patterns (e.g., personalities, interests, and values) based on their position within the family of origin (Watkins, 1984). Children do indeed appear to exist in psychologically different family configurations based on their ordinal positions. As has been described in the career counseling and assessment literature (Savickas, 1989, 1995a, 1995b; Schulenberg, Vondracek, & Crouter, 1984), counselors and researchers may wish to explore how perceived position in the family of origin influences vocational personality and patterns of vocational interests and values. The present data support conceptual and empirical works asserting the merit of examining with clients the extent to which interests and values develop from their experiences in their families of origin (MacGregor & Cochran, 1988; Niles & Goodnough, 1996; Savickas, 1995a, 1995b; Zimmerman & Cochran, 1993). The family configuration individuals experience may indeed serve as a channeling and perhaps inhibitory function which should be explored by counselors and researchers. To the extent that individuals choose and gravitate toward unique sets of careers based on different sets of values, counselors and researchers should examine the potential positive and negative impact of such familial influences. Since we are concerned that family socialization practices may be sex biased and may limit career exploration and choices of male and female children, we should also be concerned about similar impact from birth order effects on children's eventual career choices. The present findings point to the need for counselors and researchers to attend to the role of family configuration and birth order effects on individual career development and vocational behavior.

Effects of a restricted range may limit the present findings given that only children comprised a low 3% of each sample. Studies of only children further are limited by the fact that we are essentially sampling rare events.

In the Study 1 sample for example, out of 159 medical students, there were six only children. The question of the stability of findings with such low incidence samples remains extremely important. In addition, most of our statistical techniques are based on normally distributed phenomena and we are uncertain as to their utility with rare events. Using self-selected medical and college student samples also limits the generalizability of the results to other populations.

Sampling medical students does have one major advantage. In selecting a highly intelligent and ambitious sample, the current study has minimized the impact of these variables on birth-order effects. Previous studies have found that only children and firstborn children tend to be more intelligent and achievement-oriented. By using a sample of medical students, all or most of whom are high on these characteristics, we were able to examine the role of birth order presumably without a large influence from these dimensions (i.e., intelligence and achievement orientation).

Overall, results of the two studies reported provide some support for birth order as a significant variable in the study of vocational behavior and career development. Consequently, this research provides needed data on the effects of birth order on patterns of vocational interests and work values, including data on only children. The present findings also supplement existing research which identifies quantitative differences in the representation of various birth-order groups within specific occupational fields (for a review see Watkins & Savickas, 1990). Future studies should examine these differences in more diverse and systematically selected samples. Birth order appears to be both a salient and viable variable for further research within vocational psychology.

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Table 1

Means, Standard Deviations, and Analysis of Variance Results for the SCII: Medical Student Sample

	Birth-Order Group						
	Firstborn		Only Child		Laterborn		
SCII Scale	M	SD	M	SD	M	SD	F(2, 156)
GOT							
Realistic	48.10[a]	8.73	49.50	7.87	51.00[b]	8.46	2.09*
Investigative	51.83[a]	7.69	58.00[b]	5.18	54.57[a]	5.73	4.58*
Artistic	51.59[a]	8.95	55.50	8.02	55.10[b]	7.58	3.50*
Social	53.42	10.31	50.17	7.86	62.23	63.23	0.67
Enterprising	43.49	8.35	44.67	11.06	43.71	8.23	0.06
Conventional	42.76	8.79	47.00	9.82	43.28	8.04	0.70
BIS							
Agriculture	50.29	9.34	43.17[b]	9.75	52.19[a]	9.04	3.12*
Nature	50.66[a]	10.15	50.17	7.65	53.70[b]	8.04	2.31*
Adventure	55.60	9.76	50.00	12.13	56.73	8.40	1.67
Military	48.76	10.24	46.67	13.20	46.07	9.28	1.36
Mechanical	49.02	8.46	53.33	7.87	51.39	9.19	1.57
Science	51.40	8.69	54.67	7.71	52.40	6.57	0.68
Math	51.14	8.55	56.67	2.42	52.17	7.46	1.45
Medical Science	56.21	6.09	56.00	4.56	57.20	4.52	0.73
Medical Service	54.53	6.99	54.33	7.55	55.84	5.80	0.84
Music	52.37[a]	8.81	57.83	7.99	55.55[b]	8.89	2.74*

(table continues)

Table 1 (continued)

Means, Standard Deviations, and Analysis of Variance Results for the SCII: Medical Student Sample

	Birth-Order Group						
	Firstborn		Only Child		Laterborn		
SCII Scale	M	SD	M	SD	M	SD	F(2, 156)
BIS							
Art	52.00	8.83	54.33	10.46	54.17	8.06	1.21
Writing	50.58	9.09	52.50	8.39	52.89	8.56	1.24
Teaching	54.91	9.14	51.83	5.27	57.22	6.73	2.59
Social Service	51.79	10.29	53.33	9.20	54.39	9.00	1.32
Athletics	51.46[a]	8.10	43.17[b]	6.85	53.75[a]	8.09	5.18*
Domestic	51.88	8.82	53.50	4.18	52.98	8.54	0.33
Religion	48.70	10.23	47.67	9.27	49.81	9.67	0.31
Public	48.70	7.95	47.50	8.55	49.33	9.26	0.19
Law	49.65	8.91	50.17	9.66	48.81	9.39	0.18
Merchandising	44.32	8.79	45.00	12.10	43.90	9.31	0.07
Sales	43.88	7.47	43.67	11.09	43.56	7.75	0.03
Business	44.55	8.56	42.50	11.26	43.47	8.66	0.34
Office	43.40	6.59	45.50	7.12	43.58	6.55	0.28

Note. SCII = Strong-Campbell Interest Inventory; GOT = General Occupational Themes; BIS = Basic Interest Scales. Significant pair-wise differences are designated by superscripts such that [a] is significantly different from [b].

*$p < .05$.

Table 2

Means, Standard Deviations, and Analysis of Variance Results for the Values Scale: Medical Student Sample

	Birth-Order Group						
	Firstborn		Only Child		Laterborn		
Value	M	SD	M	SD	M	SD	F
Ability Utilization	17.73[a]	2.23	19.50[b]	1.23	18.06	1.87	2.29*
Achievement	17.37	2.03	18.50	1.64	17.07	2.11	1.54
Advancement	11.39	3.44	14.17	2.79	12.68	12.03	0.46
Aesthetics	12.83[a]	3.98	17.83[b]	2.04	13.79[a]	3.55	5.39*
Altruism	16.37[a]	2.86	19.67[b]	0.52	16.89[b]	2.71	4.09*
Authority	12.88	2.89	14.67	3.62	12.73	2.57	1.41
Autonomy	15.31	2.70	17.33	2.42	15.26	2.79	1.63
Creativity	13.61[a]	3.37	17.00[b]	2.53	13.97[a]	3.27	2.90*
Economic Rewards	14.17	3.52	17.00[a]	3.85	13.27[b]	3.48	3.89*
Lifestyle	15.61[a]	2.58	17.83[b]	2.23	15.70[a]	2.30	2.36*
Personal Development	16.88[a]	2.07	19.00[b]	0.89	17.30[a]	1.89	3.52*
Physical Activity	12.58	3.16	11.50	3.40	13.02	3.38	0.81
Prestige	13.27	3.99	14.00	3.69	13.30	3.36	0.11
Risk	10.83	3.93	10.17	3.92	10.65	3.40	0.11
Social Interest	14.64	3.16	15.50	2.26	14.32	2.55	0.66
Social Relations	15.37	2.83	16.17	1.33	14.77	2.48	1.59

(table continues)

Table 2 Continued

Means, Standard Deviations, and Analysis of Variance Results for the Values Scale: Medical Student Sample

	Firstborn		Only Child		Laterborn		
Value	M	SD	M	SD	M	SD	F
Variety	13.97	3.54	15.17	3.60	13.34	2.61	1.57
Working Conditions	13.59[a]	3.38	17.17[b]	2.23	13.94[a]	2.91	3.67*
Cultural Identity	10.76[a]	3.54	14.17[b]	3.55	10.98[a]	3.41	2.65*
Physical Prowess	7.32	1.89	7.33	1.63	7.67	2.27	0.52
Economic Security	15.25	2.91	17.83[a]	2.14	14.69[b]	3.23	3.20*

Note. Significant pair-wise differences are designated by superscripts such that [a] is significantly different from [b].

*$p < .05$.

Table 3

Means, Standard Deviations, and Analysis of Variance Results for the Clusters Derived from the Values Scale: Medical Student Sample

	Firstborn		Only Child		Laterborn		
Value Cluster	M	SD	M	SD	M	SD	F
Material	69.80[a]	12.01	80.83[b]	8.06	68.38[c]	11.61	3.28*
Activity	50.39	9.36	53.33	10.78	51.19	8.75	0.35
Group Oriented	40.03[a]	7.91	51.67[b]	4.18	41.47[c]	6.77	7.26*
Inner Oriented	79.37[a]	8.90	90.17[b]	6.52	79.92[c]	8.73	4.21*

Note. Results were contrasted using Fisher PLSD. Differences are designated by superscripts such that [a] is significantly different from [b] but not from [c].

*$p < .05$.

Table 4

Means, Standard Deviations, and Analysis of Variance Results for the SCII: College Student Sample

	Birth-Order Group						
	Firstborn		Only Child		Laterborn		
SCII Scale	M	SD	M	SD	M	SD	F(2,116)
GOT							
Realistic	49.09	10.09	41.5	13.40	51.86	9.88	2.68
Investigative	51.44	10.21	46.0	14.65	53.10	8.44	1.36
Artistic	52.47	9.74	58.75	5.32	50.56	8.43	2.00
Social	50.35	10.12	44.25	7.63	50.50	11.27	0.64
Enterprising	47.37	8.88	41.75	8.02	48.97	8.58	1.59
Conventional	45.49	7.59	39.00	2.71	46.10	9.73	1.21
BIS							
Agricultural	53.07[a]	10.17	41.00[b]	12.62	52.32[b]	8.13	3.26*
Nature	53.74[a]	9.70	40.25[b]	17.27	53.50[b]	9.67	3.48*
Adventure	53.14	9.81	46.25	5.91	55.78	9.19	2.69
Military	46.16	7.72	42.75	3.50	48.74	9.50	1.79
Mechanical	48.12	9.88	45.25	13.50	51.14	11.02	1.46
Science	51.54	10.47	49.00	16.67	52.86	9.62	0.45
Math	47.93	9.32	41.00	11.43	48.19	10.22	0.99
Medical Science	53.42	11.50	45.50	3.80	53.69	9.95	1.13
Medical Service	52.54	8.62	47.25	15.37	54.08	10.21	1.11
Music	53.30	11.48	63.50	3.32	51.64	9.83	2.62

(table continues)

Table 4 Continued

Means, Standard Deviations, and Analysis of Variance Results for the SCII: College Student Sample

	Birth-Order Group						
	Firstborn		Only Child		Laterborn		
SCII Scale	M	SD	M	SD	M	SD	F(2,116)
BIS							
Art	52.54	10.92	51.00	9.56	50.01	9.03	0.90
Writing	50.40	10.48	61.50[a]	3.00	48.17[b]	9.33	3.96*
Teaching	52.54	9.69	50.00	8.17	50.53	10.94	0.53
Social Services	50.84	12.04	52.75	15.71	52.21	10.16	0.23
Athletics	50.16[b]	10.38	34.50[a]	3.42	52.63[b]	9.43	6.98*
Domest	52.77	10.38	51.00	5.72	51.10	10.52	0.36
Religion	46.23	11.29	42.00	4.97	46.90	11.40	0.38
Public	50.67	9.24	52.50	9.85	52.22	9.60	0.38
Law	50.51	10.16	48.00	17.38	52.64	9.95	0.85
Merchant	46.98	8.44	41.25	12.76	48.36	9.01	1.38
Sales	46.40	7.82	45.75	9.57	47.18	7.34	0.19
Business	46.49	10.07	35.75	5.68	46.75	9.48	2.49
Office	45.09	8.30	42.00	1.16	46.29	8.03	0.74

Note. SCII = Strong-Campbell Interest Inventory; GOT = General Occupational Themes; BIS = Basic Interest Scales. Significant pair-wise differences according to Scheffe post-hoc tests ($p < .05$) designated by superscripts such that [a] is significantly different from [b]. *$p < .05$.